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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,876	08/22/2003	Rick West		1875
35619	7590	11/17/2005	EXAMINER	
DISTRIBUTED POWER 3547-C SOUTH SOUTH HIGUERA ST. SAN LUIS OBISPO, CA 93401			CAVALLARI, DANIEL J	
			ART UNIT	PAPER NUMBER
			2836	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/604,876		WEST, RICK	
	Examiner		Art Unit	
	Daniel J. Cavallari		2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,6 and 9-24 is/are rejected.
- 7) ☐ Claim(s) 3,4,7 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The examiner acknowledges a submission of the preliminary amendment filed on 9/23/2003. The changes to the claims are accepted. New claims 17-24 will be examined.

Claim Objections

Claims 1, 4, 5, 11, 12, & 19 are objected to because of the following informalities:

Claim 1 recites the limitation "the inductor" however an inductor is not previously disclosed. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "the second port" however a "second port" is not previously disclosed. Although "two DC ports" are disclosed as well as "one DC port", a first and second port still must be disclosed before making reference to them. Therefore, there is insufficient antecedent basis for this limitation in the claim. The claim will be examined as best understood to mean "a second DC port".

Claim 11 recites the limitation "the fuel cell" however "a fuel cell" is not previously disclosed. The intended use statement "for fuel cell applications" is not disclosure for "a fuel cell". Therefore, there is insufficient antecedent basis for this limitation in the claim. The claim will be examined as best understood to mean "a fuel cell".

Claim 12 recites the limitation "the two poles" and "the AC switch" however these components are not previously disclosed in this independent claim. Therefore, there is insufficient antecedent basis for these limitations in the claim. The claim will be examined as best understood to mean "where two poles of an AC switch".

Claim 17 recites the limitation "the primary energy storage inductor" however a primary energy storage inductor is not previously disclosed. There is insufficient antecedent basis for this limitation in the claim. The claim will be examined as best understood to mean "a primary energy storage inductor".

Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 4 recites the limitation of the absence of a component, the capacitor, which fails to further limit claim 3.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The term "substantially" in claims 2, 7, 8, 13, & 20 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The claims will be examined as best understood to mean "comprising of" instead of "substantially consisting of".

The term "substantially" in claims 12 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The claim will be examined as best understood to mean "driven with a signal".

The term "substantially" in claims 13 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

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The claim will be examined as best understood to mean "driven on and off at the same time".

The term "substantially" in claims 20 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Because of the 112 problems, Claim 20 cannot be examined against prior art.

Claim 15 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. Claim 15 is therefore objected to as being dependently claimed on both claims 13 and 14. See MPEP § 608.01(n). Accordingly, claim 15 has not been further treated on the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 23, & 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Peterson (US 4,947,311).

Peterson teaches:

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- A power converter (10) with an AC and DC port (12,13) and (16 & 17) (See Figure 1)
- A wave driver (34) with a port (32) coupled to the input ports (12,13) by a high frequency transformer (T1) that couples the ports (12,13) and (16,17) (See Figure 1 and Column 3, Lines 61-68)
- A method of synchronizing semiconductor switches (See Column 3, Lines 42-61)
- A DC port capable of two-quadrant operation and an AC port capable of four-quadrant operation (See Column 12, lines 8-20)
- The AC port having the capability of operating as a boost regulator (See Column 10, Lines 58-66 & Figure 1B)
- An inductor (L1) used to enable the boost function without effectively short circuiting the windings of the transformer when sourcing power from the AC port (16, 17) (See Figure 1B)

Claims 12, 13, 14, & 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kotsopoulos et al. (US 2005/0226017 A1).

Kotsopoulos et al. teaches:

- A semiconductor switch element consisting of two IGBTs (S1 & S3) connected with common emitters and are driven by the same signal (PWM signals) (See Figure 2 & Paragraph 54 & 55).

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- Elements (S1 & S2) paralleled with other switches (S2 & S4) taught to be either IGBTs or MOSFETs (See Paragraph 54) driven on and off at the same time by PWM (See Paragraph 55).
- All switches being paralleled when S1-S4 are closed (See Figure 2)

Claims 17-19, & 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Welches et al. (2003/0012038 A1)

Welches et al. teaches:

In regard to Claim 17

- A DC to AC power converter (See figure 1) with a DC port, read on by rectifier (60) and component (30) and an AC port read on by power supply 10 which is taught to be either a DC source or an AC source and rectifier (See Paragraph 69 & 70) coupled by a high frequency transformer (50) (See Paragraph 22 & 71) with a method of synchronizing switching read on by PWM (See Paragraph 15 & 16)
- An AC source intended for connection to utility or mains (See Paragraph 5 & 6)
- An inductor (L4) for filtering not located in the AC port (See Figure 1 & Paragraph 71)
- A DC port (30) capable of buck regulation (See Paragraph 69) (See Paragraph 69)

In regard to Claim 18

- An additional AC port (90)

In regard to Claim 19

- An AC or DC power input provides for use with a photovoltaic grid-interactive application (See Paragraphs 5, 6, & 69) where the DC port (30) is capable of regulating the power (See Paragraph 69-71)

In regard to Claim 21

- Three AC ports (AC1, AC2, AC3) for connection to a three-phase AC sink (See Figure 8A & Paragraph 88 & 89)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 6, 9, 10, & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson in view of Song et al. (US 2005/0078491).

Incorporating all arguments above of the power converter taught by Peterson, Peterson teaches a power converter with an AC port and DC port (12,13) and a second DC port (16,17) See Figure (4A) and where the second port is capable of either bucking

(See Figure 4A) or boosting (See Figure 4B) the voltage from the DC source but fails to teach charging and discharging a storage battery.

Song et al. teaches a DC to DC converter incorporating the charging and discharging of capacitors (108, 109) also taught to be replaceable with a battery (See Paragraph 53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the power converter taught by Peterson incorporating the DC to DC converter in which the input and output ports were connected. The motivation would have been to provide power in the case of a primary power failure at port (12, 13).

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson in view of Welches et al.

Incorporating all arguments above of the power converter taught by Peterson, Peterson teaches a power converter but fails to teach the connection of a three-phase AC source or sink.

Welches et al. teaches a conversion module from a single source to a three-phase sink, read on by loads VAC1-CAC3 (See Figure 7A & Paragraph 89).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the converter taught by Peterson incorporating the circuitry taught by Welches et al. incorporating three phase power generation from a DC source. The motivation would have been to provide three-phase power from the device.

Allowable Subject Matter

Claims 2 contains a 112 second paragraph rejection and is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and corrected of the 112 rejection.

Although prior art, such as Takagi et al. (US 2004/0070944 A1) teaches connecting the center tap of a high frequency transformer to converter circuitry, there is no motivation to combine the teachings of Peterson with Takagi et al. Further, prior art of record does not teach a high frequency transformer center tap connection as part of a converter circuit with a boost mode along with two and four quadrant operation.

Claim 3 is objected to as being dependent upon claim 2 which contains a 112 second paragraph rejection, but would be allowable if rewritten in independent form including all of the limitations of a corrected claim 2.

Claims 4 are objected to as being dependent upon an objected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim.

Claims 7 & 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Song et al. further teaches a 50% duty cycle (See Paragraph 142)

Divan (US 5,017,800) teaches an AC to DC power converter incorporating a three phase motor (See Figure 5), a switched center tapped transformer (74) with a battery supply (66), AC input (51,52) (See Figure 4) and three phase capabilities (See Figure 5)

West et al. (US 2004/0165408) teaches a DC to AC inverter connected to a utility grid and photovoltaic array.

Ropp et al. (US 6,429,546) teaches a conversion system connected to a utility grid and photovoltaic array.

Takagi et al. (US 6,650,552) teaches a power conversion system incorporating a center tapped high frequency transformer and boost circuit.

Suzuki et al. (US 5,856,712) teaches a UPS system incorporating an AC source (20), center tapped high frequency transformer (16), battery backup supply (7) (See Figure 3)

Loh (US 6,175,510) teaches a UPS system with a high frequency transformer

Balogh et al. (US 6,246,592), Watanabe et al. (US 6,064,580), and Reddy (US 6,479,970) teach a power supply converter with a center tapped high frequency transformer

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Cavallari whose telephone number is (571)272-8541. The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571)272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DJC

November 7, 2005


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